MIC Series 412TF Thermal Camera

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BOSCH
Invented for life

- Dual thermal/optical operation
- Brushless motor technology
- Robust design
- Integrated wiper unit
- Host of mounting and viewing options

The MIC Series 412 thermal camera has been designed to offer an extremely reliable, robust, and high quality surveillance solution for security applications that demand the very best performance. Precision engineered to exacting standards, the device offers the most ruggedized dual optical/thermal image capture solution available on the market today. Containing both a high quality optical day/night camera module and a thermal imaging module that sit side-by-side within the housing, the compact MIC Series 412 thermal camera switches between a high resolution optical camera and a high performance thermal camera at the press of a button on the control keyboard.
A 36x day/night camera is paired with the latest 50 mm un-cooled thermal imager to provide a range of enhanced viewing options, such as spectral heat variance, and hot and cold spot highlights. The thermal imager has built-in sun protection that allows the camera to self-heal should it be pointed directly at the sun.
Brushless motor technology ensures ultra-reliable, whisper-quiet operation while groundbreaking resolver technology provides pinpoint accuracy, affording the user full 360° continuous rotation pan and 260° tilt control.

The MIC Series 412 thermal camera is compatible with all MIC Series connection cables, brackets, control equipment, and non-IR power supply units for ease of installation, integration, and operation.

System overview

Examples of optical and thermal modes

Optical image / Thermal image in white hot spot mode

Thermal image in black hot spot mode / Thermal image in ice and fire mode

Thermal image in glow bow mode / Thermal image in iron bow mode

Functions

Separate optical and thermal cameras
Switch between optical camera and thermal imager at the press of a single button.

Brushless motor technology
Whisper-quiet operation and smooth control is provided through use of ultra-reliable brushless motors.

Robust design
Machined from solid aluminum, the MIC Series 412 thermal camera ensures corrosion protection by using two different processes; first an Alocrom 1200 coating, then a robust, powder paint coating. Alocrom 1200 is a chromate conversion coating of aluminum, used in the aerospace and defense industries where a protective layer is required to improve corrosion resistance. Sealed with 'O'-rings, the device can operate submerged up to 1 meter (3.3 feet) underwater by virtue of its design and construction.

Notice
The thermal camera will show no detail if submerged.

Integrated long-life silicone wiper and heater
Thanks to its integrated wiper and heater, the MIC Series 412 thermal camera is able to capture the highest possible quality image all year round, regardless of the weather.

Host of mounting and viewing options
Faultless operation, either upright or inverted, gives the user a host of mounting and viewing possibilities

Easy to use
Provides the same easy to use functionality of all MIC series cameras, including the same connection cables, brackets, control equipment, and non-IR power supply units.

Notice
MIC412TF models require a US Department of Commerce export license--one license per customer--arranged prior to the camera being built. For more information, contact your local Bosch Security Systems Customer Service Center.

Certifications and approvals

Electromagnetic Compatibility (EMC)	Complies with FCC Part 15, ICES-003, and CE regulations, including EN50130-4, EN61000-3-2 & 3-3, EN55022 and EN50121-4
Safety	Complies with CE regulations, UL, EN, and IEC Standards 60950-1 & 22
Weatherproofing	IP68 (1 m submersion for 24 hrs)

Technical specifications

Camera Module (optical)

Image sensor	1/4-inch EXview CCD
Horizontal resolution	(WDR) 36x module, 530 TVL NTSC/PAL typical
Filter	Automatic mechanical IR cut filter
Focus system	Auto or manual
Iris	Auto or manual with slow shutter integration modes
Synchronization	Internal / External (V-Lock)
Signal-to-oise ratio (SNR)	50 dB or more
Back Light Compensation (BLC)	On/Off
White balance	Automatic
Automatic Gain Control (AGC)	-3 to -28 dB, 2 dB steps
Aperture control	16 Steps

36x optical zoom module

Lens	F=3.4 mm (WIDE) to 122.4 mm (TELE), F1.6 to F4.5
Zoom	36x optical (12x digital)
Angle of view	57.8º (WIDE end) to 1.7º (TELE end)
Minimum illumination	1.4 lux (1/60 s NTSC, 1/50 s PAL, typical, F1.6, 50IRE) 0.1 lux (1/4 s NTSC, 1/3 s PAL, typical, F1.6, 50IRE) ICR-ON mode: 0.01 lux (1/4 s NTSC, 1/3 s PAL)
Shutter speed	1/4 to 1/10,000s (20 steps) NTSC, 1/3 to 1/10,000s (20 steps) PAL

Camera Module (thermal)

Lens	50 mm	
Image sensor	Focal Plane Array (FPA), un-cooled Vanadium Oxide microbolometer 30 Hz NTSC, 25 Hz PAL; US export license required.	
Picture elements	324(H) x 256(V)	
Spatial resolution	0.760 mrad with 50 mm lens	
Field of view	14°(H) x 11°(V) with 50 mm lens	
Focus	Factory-set at infinity focus	
Spectral response	7.5 to 13.5 µm	
Thermal sensitivity	<85 mK at F1.6	
Electronic zoom	2X	
Features	White hot, black hot, and false color modes	
Performance Range	**Human 1.8 x 0.5 m (5.9 x 1.6 ft)**	**Object 2.3 x 2.3 m (7.5 x 7.5 ft)**
Detection	780 m (2559 ft)	2.2 km (2200 m) (7218 ft)
Recognition	200 m (656 ft)	590 m (1,936 ft)

Operational

E-flip	Yes, E-flip enables the optical camera to invert the image
Manual flip	Yes
Presets	64 telemetry presets accurate to less than 0.1°utilising resolver technology (using FV protocol, 10 camera set-up presets to allow ANPR, color correction etc.)
Preset tours	6 tours each with up to 32 presets
Sector titles	Yes (64 sectors) 20 characters per title
Preset titles	20 character caption for each of the 64 presets
Home position	Yes (preset 1 or tour)

Communication and Protocols

Communication	RS485 / RS422
Control protocol	Bosch or FV protocol cameras available; additional protocols supported are Pelco D, Kalatel, Panasonic, and VCL. These can be loaded using the MIC-USB485CVTR signal converter and Cam-set via a PC. Biphase control requires a Biphase to RS485 converter (MIC-BP4, available separately) installed in the MIC Series PSU to connect to Biphase equipment.

Connectivity

Video	Single co-axial via composite cable (optical/ thermal cameras, user switchable)
Telemetry	Twisted pair; Simplex, half and full duplex operation via composite cable
MIC Universal Camera Setup Software Utility (Camset)	Supplied with each camera, Cam-set allows direct connection to a USB-equipped PC via the MIC Series PSU over a full duplex or IP network to provide access to all camera functions and useful diagnostic tools
USB to RS485 signal converter	Allows MIC Series cameras to connect to a PC (supplied free with camera, or available separately)
Power	Via composite cable

Alarms

Alarm inputs	1 tamper input (additional inputs possible with optional alarm card in MIC Series PSU)
Alarm communication	Tamper switch (ground connection)

Mechanical

Drive unit	Brushless integral pan/tilt motor drive
Pan angle	360° continuous rotation
Pan speed	Up to 72° per second (variable)
Tilt angle	260°
Tilt speed	0.2° to 90° per second (variable)
Speed control	Closed loop electronics
Preset accuracy	±0.30 degrees (typical)
Proportional Pan/Tilt to Zoom	Yes

Electrical

Input voltage (dual source)	18VAC, +/-10%, 50/60 Hz
Input current	Camera: 2 A Heater: 1 A

Environmental

Operating temperature	-40 °C to +50 °C (-40 °F to +122 °F)
Weatherproofing	IP68 (1m submersion for 24 hours)

Construction

Dimensions (W x H x D)	267 x 445 x 200 mm (10.51 x 17.52 x 7.87 in.)
Weight	9.5 kg (20.94 lb) (including 4-in. PCD base)
Viewing window	Tempered flat glass (optical) and germanium covering (thermal)
Construction material	Machined aluminum

Standard colors	Black(RAL9005), Grey (RAL7001), or White (RAL9003)
Standard finish	Alocrom 1200 surface treatment with powder coat paint
Window wiper	Standard, long-life silicone wiper
Heater	Standard
Configurations available	Upright mount or inverted (Inverted mount is possible using software setting and upright camera.)

Ordering information

MIC412TFBUP13636N 30Hz, 36X NTSC Thermal Camera, Black
30 Hz Dual Thermal, 36X, NTSC, PTZ camera, Black, Bosch Protocol with integrated wiper and heater. Requires US Department of Commerce export license—one license per customer--arranged prior to camera being built.
Order number **MIC412TFBUP13636N**

MIC412TFWUP13636N 30Hz, 36X NTSC Thermal Camera, White
30 Hz Dual Thermal, 36X, NTSC, PTZ camera, White, Bosch Protocol with integrated wiper and heater. Requires US Department of Commerce export license—one license per customer--arranged prior to camera being built.
Order number **MIC412TFWUP13636N**

MIC412TFDUP13636N 30Hz, 36X NTSC Thermal Camera, Sand
30 Hz Dual Thermal, 36X, NTSC, PTZ camera, Sand, Bosch Protocol with integrated wiper and heater. Requires US Department of Commerce export license—one license per customer--arranged prior to camera being built.
Order number **MIC412TFDUP13636N**

MIC412TFBUW13636P 25Hz, 36X PAL Thermal Camera, Black
25 Hz Dual Thermal, 36X, PAL, PTZ camera, Black, FV Protocol with integrated wiper and heater. Requires US Department of Commerce export license—one license per customer--arranged prior to camera being built.
Order number **MIC412TFBUW13636P**

MIC412TFWUW13636P 25Hz, 36X PAL Thermal Camera, White
25 Hz Dual Thermal, 36X, PAL, PTZ camera, White, FV Protocol with integrated wiper and heater. Requires US Department of Commerce export license—one license per customer--arranged prior to camera being built.
Order number **MIC412TFWUW13636P**

MIC412TFGUW13636P 25Hz, 36X PAL Thermal Camera, Grey
25 Hz Dual Thermal, 36X, PAL, PTZ camera, Grey, FV Protocol with integrated wiper and heater. Requires US Department of Commerce export license—one license per customer--arranged prior to camera being built.
Order number **MIC412TFGUW13636P**

Accessories

MIC-24PSU-UL 24 VAC Camera Power Supply
24 VAC, 50/60 Hz power supply for MIC Series cameras
Order number **MIC-24PSU-UL**

MIC-115PSU-UL 115 VAC Camera Power Supply
115 VAC, 60 Hz power supply for MIC Series cameras
Order number **MIC-115PSU-UL**

MIC-240PSU-UL 240 VAC Camera Power Supply
240 VAC, 50 Hz power supply for MIC Series cameras
Order number **MIC-240PSU-UL**

UPA-2450-50 Power Supply, 220 V, 50 Hz
220 VAC, 50 Hz, 24 VAC, 50 VA Out
For use with certain 24 VAC camera models.
Order number **UPA-2450-50**

UPA-2450-60 Power Supply, 120 V, 60 Hz
120 VAC, 60 Hz, 24 VAC, 50 VA Out
Order number **UPA-2450-60**

MIC-2M Composite Cable
2 m composite cable with plug for power, data and video
Order number **MIC-2M**

MIC-10M Composite Cable
10 m composite cable with plug for power, data and video
Order number **MIC-10M**

MIC-20M Composite Cable
20 m composite cable with plug for power, data and video
Order number **MIC-20M**

MIC-25M Composite Cable
25 m composite cable with plug for power, data and video
Order number **MIC-25M**

MIC-DCA-B Deep Conduit Adapter, Black
Deep conduit adapter for 4 in. PCD base - black leatherette finish, RAL9005
Order number **MIC-DCA-B**

MIC-DCA-G Deep Conduit Adapter, Grey
Deep conduit adapter for 4 in. PCD base - grey leatherette finish, RAL9010
Order number **MIC-DCA-G**

MIC-DCA-W Deep Conduit Adapter, White
Deep conduit adapter for 4 in. PCD base - white leatherette finish RAL9003
Order number **MIC-DCA-W**

MIC-SCA-B Shallow Conduit Adapter, Black
Shallow conduit adapter for 4 in. PCD base - black, leatherette finish, RAL9005
Order number **MIC-SCA-B**

MIC-SCA-G Shallow Conduit Adapter, Grey
Shallow conduit adapter for 4 in. PCD base - grey, leatherette finish, RAL7001
Order number **MIC-SCA-G**

MIC-SCA-W Shallow Conduit Adapter, White
Shallow conduit adapter for 4 in. PCD base - white, leatherette finish, RAL9003
Order number **MIC-SCA-W**

MIC-SPR Spreader Plate
Aluminum spreader plate suitable for brickwork surface mounting – black leatherette finish RAL9005
Order number **MIC-SPR**

MIC-SPR-G Spreader Plate, Grey
Aluminum spreader plate suitable for brickwork surface mounting, grey leatherette finish (RAL7001)
Order number **MIC-SPR-G**

MIC-SPR-W Spreader Plate, White
Aluminum spreader plate suitable for brickwork surface mounting, white leatherette finish (RAL9003)
Order number **MIC-SPR-W**

MIC-CMB-B Corner Mount Bracket, Black
Corner mount bracket, black leatherette finish (RAL9005)
Order number **MIC-CMB-B**

MIC-CMB-G Corner Mount Bracket, Grey
Corner mount bracket, grey leatherette finish (RAL 7001)
Order number **MIC-CMB-G**

MIC-CMB-W Corner Mount Bracket, White
Corner mount bracket, white leatherette finish (RAL9003)
Order number **MIC-CMB-W**

MIC-PMB Pole Mount Bracket
Pole mount bracket (includes 2 x 455 mm stainless steel banding straps for pole diameters 75 to 145 mm)
Order number **MIC-PMB**

MIC-WMB-B Wall Mount Bracket, Black
Wall mount bracket, black leatherette finish (RAL9005)
Order number **MIC-WMB-B**

MIC-WMB-G Wall Mount Bracket, Grey
Wall mount bracket, grey leatherette finish (RAL7001)
Order number **MIC-WMB-G**

MIC-WMB-W Wall Mount Bracket, White
Wall mount bracket, white leatherette finish (RAL9003)
Order number **MIC-WMB-W**

MICUSB485CVTR2 USB to RS485 Signal Converter
USB to RS485 signal converter to allow MIC Series cameras to connect to a PC, supplied with each camera
Order number **MICUSB485CVTR2**

MIC-BP4 Biphase Converter
Biphase converter for non-IR versions of MIC series power supply units
Order number **MIC-BP4**

MIC-ALM Alarm and Washer Pump Drive Card
8 Input alarm and washer pump drive card for PSU (Not for IR PSU)
Order number **MIC-ALM**

MIC-WKT Washer Kit
Washer kit for non infrared MIC models (includes washer pump drive card, washer nozzle and mounting brackets for wall and 4 in. PCD base)
Order number **MIC-WKT**

HAC-WAS05-20 24 VAC Washer
24 VAC washer inst. 4M 25L
Order number **HAC-WAS05-20**

HAC-WAS05-50 230 VAC Washer
230 VAC washer inst. 4M 25L
Order number **HAC-WAS05-50**

HAC-WAS30-50 230 VAC Washer
230 VAC washer inst. 30M 25L
Order number **HAC-WAS30-50**

MIC412 Sunshield
Sunshield kit for the MIC412 camera; white.
Order number **MIC412SUNSHIELD**

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2317571723 | en, V5, 04. Oct 2013